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Legal Implications on Sales and Purchase, Uses and Misuses of Agro Chemicals in Smallholders' Agro Production in Malaysia

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Abstract

Purpose of this study is attempted to look into laws and prohibition on sales and purchase, use and misuses of rural farmers' agrochemicals towards the agro food production and conservation of ecosystem in Malaysia. Agrochemical such as artificial fertilizers, fungicides, herbicides and insecticides in manageable of rural farmers' food yielding production could cost human hardship upon consumptions and detrimental to conservation. Economic sustainable minimal or chemical free tropical food yielding agriculture food crop not only will reap in profits in upgrading income and livelihood but will definitely create a good environment in developing countries. There are significant differences on laws and prohibition on sales and purchase, use and misuses of rural farmers' agrochemical application towards the agro food production and conservation of ecosystems in Malaysia and other developing countries with the implementation of laws on agriculture chemicals.

Keywords: Agriculture; conservation; agrochemicals; food production

1. Introduction

Agrochemical is a must in developing and underdevelop countries such as Malaysia and its neighbours, world agrochemical market though is predicted to reach $223 billion in 2015 (2010, industry research by report linker), Throughout the years, farmers and smallholders has been using a lot of agro

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chemicals in their production of agriculture produces, both vegetable (Legumes, leafy, tuber); fruits and cash crops either for own consumptions or sales, subsistence or monoculture in nature. Therefore, Carvalho (2006) quoted that the uses of agrochemicals in a tropical country particularly fertilizers and pesticides is a common practice. Agrochemical normally comprises of four categories of herbicides, insecticides, fungicides and fertilizers. The market for agrochemicals is vast and huge in Malaysia and other developing countries, as the weather is as such that there is a need of application of Agro chemicals to maintain and sustain the farmers and smallholders' livelihood.

The common chemicals that applied by farmers and smallholders in Malaysia and other countries in the tropical region are herbicides, insecticides, fungicides and fertilizers. The nature of the environment in the tropical countries with evergreen lustre and warm and humid temperature encourage the faster growth of undergrowth and the cycles of hatching of farm insets. Farmers can't afford to practice netting and organic farming as many of them are subsistence and small scales in nature whereas smallholders practice semi and mixed commercial monoculture are impossible to go organic. Therefore, the application of Agro chemicals is the only means towards their ends.

The crucial issues in this research is the uses and misuses of agrochemicals in farmers and smallholders agro production in developing countries such as Malaysia, as farmers and smallholder of the rural areas maybe illiterate or ignorance, but they knew very well those outlets to get those agrochemical to protect their crops, because that is their livelihood and the whole family depend on the output of their effort in toiling and harvesting the agro produces for the consumers' market throughout the country and regions. The other crucial aspect is the agrochemical suppliers and middleman who sells agrochemicals to the farmers and smallholders. They may know the process of selling and marketing of the agrochemicals for profits, with just a registration and application of selling licenses to sell agrochemical in their premises. The question is, do we have any governmental rules, regulations or laws and its legal implications on uses and misuses, sales and purchase, and its impact towards human and environment of the country? What are the short term and long term outcome of agrochemical that detrimental towards mankind and the environment? What are the combine efforts by the tripartite of government-Agro suppliers-farmers to eradicate or educate the stakeholders in the agriculture industry? As well as consumer awareness towards the buying and consumption of agro produces?

2. Review of Literatures

Not much of the law enforcement has been known after the agrochemicals transport and dispatched to the local agro retail shops from agro suppliers or from custom checkpoint of whichever agrochemical suppliers import from outside of the country. The most important issue is when the agrochemicals were sold to the farmers and smallholders. It is very seldom for the Agro retailers to advice the farmers and smallholders the process of application, safe usage and safe keeping as well as steps that farmers and smallholders should take after application of agrochemicals on their holding. Akinpelu et.al(2011) has revealed that the health impacts of agrochemicals both pre and post emergence herbicides, insecticides, pesticides etc. used in cassava production are a function of their degree of accumulation in environment sink – soil , air, water, plant and the degree to and form in which humans are exposed to them. Hence, the harmful agrochemicals applied on the plants and soils will definitely hazardous to mankind and ecosystem if uncheck.

There is no record ever done by the Agro retailers on the sales of agrochemicals to the farmers and smallholders. Maybe there are inventories of stocks for agrochemicals by the Agro retailers. Further there also are no records on the usage and inventories of agrochemicals by farmers and smallholders either. Although there are laws and regulation enforced by the local governmental agriculture department on supervision, checking, penalties and advisory panels comprising of the qualified government agriculture

department staffs both to the agro retailers and farmers but seldom have they practiced what are supposed to do. There are also lack of local institutional and private studies and research on the impacts of agrochemicals application on human and environment. Once the ecosystem destroyed would not be revert again. Agrochemical even will affect the farm pest and small animals. Rohr et.al(2008) from their field survey has shown clearly that usage of the herbicide, atrazine and phosphate has caused the decline in farm amphibian like frog.

Though the application of agrochemicals on crops in the agriculture sector will enhance the need of sufficient demand by consumers but Fianko et.al (2011) has shown that wide spread in using of agrochemical in Ghana has contributed immensely to increased food supply and improved public health, but it has caused tremendous harm to environment, water bodies, fish, vegetables, food, soil and sediment have been found to be contaminated. Evidence also shows farmers have overused agrochemicals especially pesticides, biological monitoring studies that farmer are at higher risk for acute and chronic health effects associated with pesticides due to occupational exposure. Therefore, after tax and after application of agrochemicals should be monitor closely by government authority and experts to minimize the health hazard towards human and environment. Tekwa et. al (2010) has survey in location like Digil, Gella, Lokuwa and Shuware in Mibi environment, they have shown that three principle farm hazards management types namely week, insects and soil fertility surveyed, insecticides application was accounted as the highest (70%) source of form hazard in Gella, farmers' health hazard, crop damage and animal health hazard recorded of tremendous losses. Maduka (2006) has quoted that agrochemicals such as herbicides, pesticides, halogenated polycyclic hydrocarbons has exposed man and animal health wise. Whereas Glenn and Toole (1997) also quoted that agrochemical form the biggest percentage of pollutants that contaminate the environment, the hazardous particles from agrochemicals has polluted the environment once apply, into water, air, sea, lake, atmosphere, land and soil. Care must take when application of agrochemicals on the agriculture sector. Ignorance of farmers may cost sickness in life.

Okoye (1992) survey that crop planted on soils polluted by agrochemical varying concentrations. In the course of absorbing water and nutrients from the soil, plants take up the chemical. The agrochemicals cannot be degraded because it lacks the enzyme machinery to degrade and excrete them. They are deposited in tissues and cellular structures including those of edible parts that are not active in metabolism. Magauzi et.al(2011) has shown the result from their study that the prevalence of organophosphate poisoning, indicated by cholinesterase activity of 75% or less is 24.1%. The medium period of exposures to agrochemical was 3 years. Egyir et.al(2011) have proven from their study in Ghana that proper adoption of agrochemicals is positively associated with being literate, older than 40 years of age, having higher income from sales, living in village distant to urban area, having access to hi-tech machinery and being a link to extension services and financial institutions.

3. Discussion

As far as tropical and subtropical agriculture are concern, most of the underlying concerns are the countries that lies in these regions are comprising of the developing and underdevelop countries where the tropical and subtropical climate changes limitedly, the evaporation and precipitation rate is high, warm and humidity that causes a lot of insects eggs to hatch into larvae within the 14 days cycle. Therefore, the evergreen and lush vegetation attracted a lot of insects and the infestations of insects on the grown agro greens are not be able to harvest on time within that 14 days hatching cycle of those insects and will be destroy by its larvae and warms before the insects will goes for another hatching cycle under the soil. The only way out that farmers are able to get a par of whatever they have invested in their plot of vegetable land is using Agro insecticides.

3.1. Literate and ignorance

The countries of tropics and subtropical region, farmers are illiterate and ignorance in the usage of agrochemical. Even though, each bottle and packages of agrochemical comes with instructions but 90% of farmers do not read and follow strictly to the instruction. For example, the amount and ratio of agrochemical that mix with water before spraying, when and the time frame to spray, types of utensils also are important in the spraying process. Instant that farmers contract cancer of skin and cancer of lung after inhaling or contact directly with the type of banned agrochemicals. Therefore, ignorance could kill, and the consequences are farmers who ignore the instruction in the application of agrochemicals will suffer themselves.

3.2. Unfamiliar of agro chemical

Certain types of new agrochemicals that imported from Thailand and other neighbouring countries only show their language that not every farmer could understand or read. Therefore, they unfamiliarity of this kind of agrochemicals with its application also could court danger, not only to themselves but also to those consumers who buy and consume the produces.

3.3. Misuse and simply mix

Farmers from Malaysia normally simply mix up the agrochemical before application, example herbicide, instead of a singular type of agrochemical they spray, farmers tends to mix more than two types of herbicide for their weeding of their farm. This kind of misuses could cause a lot of hardship to them and others.

3.4. Desperation

At a certain juncture, farmers and smallholders are more desperate in using the agrochemical to protect their interest. Otherwise, there will be less or no harvest at all. Undergrowth need to be clear, herbicide will have to use to, fertilizer need to be apply. When the plants start to grow, insecticides need to use to rid of those insects and worms that destroy the plant. Sometime fungus attack the root part of plants therefore fungicides need to be used to cure the plants. All these agrochemicals apply on the plants need careful scrutinize by experts from agriculture department. Otherwise, the misuses will cause hardship to the consumers.

3.5. Hearsay

Farmers and smallholder from the rural area who tends to their small plot of holding for subsistence crops will normally never seek any advice from qualify agriculture department staffs on the application of agrochemicals on their holding and crops. Certain warning from government agencies was treated as hearsay. They practice what has been pass down from their elders. The farmers and smallholders even consume themselves of whatever Agro produces they have, therefore the first casualty in this group of people.

3.6. Middleman, credits and financing

Due to the pressures from agriculture middleman's demand for good quality Agro produces for export in regions of high demand. The farmers and smallholders use excessive agrochemicals on their crops. Sometime farmers and smallholders tends to borrow money to finance their planting and replanting of crops, they need to refurbish their loan and credits from loan sharks, they will have to produce good quality Agro produces in a fast pace, therefore, excessive agrochemicals also apply and harvest immediately after spraying. The chemical residue if uncheck, consumers who consume the produces will suffer, maybe in the long run.

3.7. Types of agrochemicals

Agrochemicals uses by farmers and smallholders comprises of four big categories, namely insecticide, herbicide, fungicide and fertilizer. All the agrochemicals sold in the market are either in solution form or granular form, the toxicity of each type and brand of agrochemicals are label with colour like green, pink, red and black followed the severity of the toxicity with the sign of skull as a warning sign to the buyers. Agrochemicals especially insecticides are colourless and odourless. All types of agrochemicals posted danger and severity towards human and ecosystem if not handled and applied with care. Insecticides sold in the open shelves in Agro retailing shop are Malathion57%; Dimethoate 38%; Cypermethrin 5.5%; Deltamethrion 1.4%. These are the common types of insecticides uses by farmers and smallholders. It is effective on Helicoverpa Armigera (Chilli borer); Cnaphalocrocis Medinalis (leaf roller); Helpopeltis Theobromae (insect sting young cocoa fruits); Cocopimorpha Cramevella; Planococcus, Apogonia (cocoa pod borer); Coptotermes (termites); Spodoptera Litura, Curvignathus; Helicoverpa Armigera (Warms); Myzus persicae, Thrips; Plutella Xylostella; Hellila Undalis; Brevicoryre Brassicae (Leaf bugs); Valarga (grasshopper), Apogonia (Bug borer). All types of insecticides post danger to human and ecosystem. Normally, if spray on the vegetable crops, the harvesting period will be after fourteen days but due to ignorance and demand, farmers normally will harvest in the next day after spraying. Therefore, it is utmost danger to consume those Agro greens. Those consumers who know will never want to buy and consume but normally consumers in the town area will never know.

Fungicides sold openly in agro retailing shops are Macozeb 80 80%; Thiophanate-Methyl 70%; Benomyl 50%; Copper-Oxychloride 85%. It is effective on various type of plant root fungi and bicarptra. Fungicides may not post danger to farmers and consumers because it only will rid of those fungi that attack the root of plants especially fruit trees. Then it definitely will harm the ecosystem because the residue will affect the soil and dilute with rain water to flow into the rivers. Herbicides or weed killers that sold in the Agro retailing shops or outlets post the most dangers to human and environment, it come with many trade names but generally it comprised of herbicides for weeds like Paraquat Dichloride 13%; MSMA 55%; Glufosinate-Ammonium 13.5% (Basta 15); Glyphosate Isopropylamine 41% (Round-up). Herbicides mean to rid of bushes and small trees comprised of 2,4.D-Amine 48%; Diuron 80 80%; Metsulfuron-Methyl 20% (Ally). Normally farmers and smallholders suffer bodily injuries from ignorance of spraying herbicide. Appliances that they used for spraying must be right, protective clothing and mask must be wear and the time of the day that most suitable for spraying herbicide is early morning and evening because during these hours, there will be less windy and calm. Otherwise, if inhaled, in the long run, farmers will contract skin and lung cancer, especially if they are using fogging machine.

Sometime farmers and smallholders also apply herbicides to poison bushes and small trees, these agrochemical consisted of Triclopyr Butoxy Ethyl Ester 32.1% w/w (garlon 250); Fluroxypyr Neptyl Ester 29.6% w/w (Starine 200). Either spray directly or mix with other types of general herbicides to spray together. Herbicides are effective on Calopogonium; centrosema puereria; leguminous Creeping

cover; eupotoriumodorathuim; asystasia gangetica; mikania micrantha; paspalum conjugate; borreria latifolia; melastoma affine. Farmers and smallholders occasionally even by buying and using banned agrochemicals for Insecticides classify as Class 1A (Black line) like Monocropthos (Azodrin); Metamidplos (Tamaron) and Class 1B (Red line) like Linduned and banned herbicide like 2-4-5 T and Sodium Arsenic when they are desperate to get rid of the insect and herbs immediately.

The latest agrochemicals for organic farming that suppose are safe for application for insecticides like Diflubenzuron 25%. Its effect is to retarded the egg and growth of insects; Organophosphate (Tricel 21.2 EC) is to retard the growth of insect and its eggs from hatching, also for organic farming and Bacirluy, agrochemical for Leaf Foliar for growing, flowering and fruiting. All these latest agrochemical which wouldn't cause bad effects to human and environment are too expensive and beyond the reach of farmers and smallholders from developing and underdevelop countries in the tropic regions. Most of these agrochemicals are used by farmers from develop countries, because their government formulated law and regulation to guarded the health of their citizen and environment. Legal Provision in Malaysia in the application, sales and purchase of agrochemical are limited. Like other developing countries, Malaysia emphasizes on the issue of misuses and improper sale of agro chemicals among suppliers and rural farmers. These criminal activities must be observed in order to preserve the safety of consumer, human body, animal, growing crops and the conservation of ecosystem. Among the preventive action supplied by the government are by preparing the legal provision and enforcement of the law such as Pesticides Act 1974, Poison Act 1952, Food Act 1983, Environmental Quality Act 1974, Safety and Healthy Act 1994, Fumigation of Hydrogen Cyanide Act 1953 and many regulations and guidelines. The relevant statute apply in Malaysia for the agrochemical namely Pesticide Act 1974 which known as Act 149. The Act which contains 61 sections is made to control the activity of manufacturer, sale and storage, supply, register, the jurisdiction of government over the enforcement of the Act and so forth.

According to Section 2 of Pesticide Act 1974, pesticide means any substance that contains an active ingredient or any preparation, mixture or material that contains any one or more of the active ingredients as one of its constituent, but does not include contaminated food. Pesticide in this definition includes any Agro chemical that being used to protect plans against insect, fungi and rodents. The terms of insecticides, fungicides, herbicides, artificial fertilizer, and regicides are within this interpretation. Section 3 until Section 6 of the Act, prescribes the Pesticides Board. The objectives of the Boards are to control the quality and activities of the agro chemicals which must be in line with the statutes and regulations.

Section 7 to Section 14 of Pesticide Act 1974 discusses the activity of importation and manufacture of pesticides by registration and permit. Hence, a person who desires to import or manufacture agro chemicals shall apply to the Board for registration of the pesticide. There are several conditions that the applicant must be fulfilled. Among others are the statement of the common name of the pesticide, its trade name, chemical name and its structural formula, the name and concentration of every ingredient including detail toxicological information on every ingredient of the pesticides. The applicant also must label the pesticide with the instruction and precautionary measure to be taken. Besides that, the report of efficacy and safety of the pesticides, a statement of the methods of determining the residue on plants or crops must be submitted to the Board. It is necessary for the applicant to submit the address of the place of business of the applicant or the place where the applicants intends to store the pesticides. If the applicant is a manufacturer, he must submit the name and address of the factory, building or premises at which the applicants intends to manufacturer the chemicals and prescribe an outline the process of manufacture the pesticides. The registration must be made with a prescribed amount of the fee. All these procedures are stated under Section 7 of Pesticides Act 1974. Section 8 further states that upon received the application, the Board will conduct the inquiry and investigation as to ensure that the applicant had fulfilled several conditions. There are 3 conditions composed. Firstly, the Board shall confirm that the matters contained in and submitted are true. Secondly, the label and package are complied with the regulations and lastly,

the chemical would be efficacious or safe to human beings and animals if used or handled according to the instructions contained in its proposed label. Even though, if constitute a risk, it shall a minimal extent as to be outweighed by the necessity or advantages of using the pesticide. The Board also may put any additional relevant requirement of standard specification. If the Board satisfies with the application, the Board will state the class of pesticides by assigning a registration number thereto and issue a certificate of registration to the applicant. On the other hands, the Board shall not register the chemical is not satisfied with any of those requirements.

Section 9 of the Act mention that the period of pesticide registration is only for five years and the applicant of registered pesticide may re-register the chemical at the end of every five years period. The procedure of registration is similar with the first time application. As soon as possible after the pesticides has been registered or register again, the Board shall cause the fact to be published to the Gazette together with particulars relating to identification of the pesticides. This is stated under Section 12 of the Act. Section 13 of the Act prohibits the activities of importation and manufactures the misbranded chemical and nonregister pesticide. Those who in contravene with this provision may be convicted to five years imprisonment or fine of fifty thousand ringgit. If the accused people repeat the conviction, he may be imprisonment for ten years or to fine one hundred thousand ringgit or both. However, the applicant may import the pesticide for education and research purpose. They have to apply to the Board accompany with fee. In consideration, the Board will issue the permit to import the pesticides.

Section 15 until Section 17 of the Act discusses the activity to control the manufacture, sale and storage of pesticides by licensing. Those who intend to manufacture the pesticide shall apply to the Board in the prescribed manner with a payment of fee for licenses to manufacture the pesticide. Section 15 of the Act has list down the requirements which the Board has to concern with. The conditions are the pesticide shall be registered under the Act, the applicant is technically competent to manufacture the pesticide and the applicant is aware of the toxicity of the pesticide and the risk involve in using and handling it. If the Board satisfies with the application, the Board will then granted a license to the applicant. The licenses however, do not authorize the sale and storage of the chemical more than at one premise. Instead, the applicant shall specify the premise which storage and sale of pesticide is authorized. The applicant may sale or storage the one or more chemicals which in the same or difference class of pesticide at the premise specified. The licenses is valid for a period of three years from it's issued but may be renewed on payment of the prescribed fee. Section 18 of the Act gives power to the Board and Licensing Pesticide Officer to revoke, cancel and suspend for some period, the licenses to manufacture, sale and storage the pesticide if they found that the application contain a misrepresentation of the material fact or the holder of the licenses is fail to comply with the condition and requirement required by the Act. The Board shall give the holder of the licenses an opportunity to show cause against so acting and he then may appeal against the Board or Pesticides Licensing Officer. If the holder dissatisfies with the refusal of the Board, he then may appeal to the Minister whose decision shall final. Section 20 of Pesticides Act prescribes that no person shall manufacture, sell or store for sale the pesticides unless licensed under this Act. The holder is only allowed to sell or store for sale the pesticide at the premises specifies in a licenses. Misbrand chemical also prohibited. Those who contravened with this section is committing an offence and is liable for three years of imprisonment or a fine for ten thousand ringgit for the first conviction or imprisonment for six years or to a fine of twenty thousand ringgit for the subsequent conviction. Section 21 until 26 emphasize on control of presence of pesticides in food.

4. Conclusion

In conclusion, agrochemicals manufacturer and producers, agrochemical importers, agro retailers should be register with government agro and drug agencies annually. All sales of agrochemical and

applications should be supervised closely. Education is the most important factors in reducing casualties and injuries in agrochemicals application and usage. The tripartite of government-agro retailer-farmers should be collaborate in the sales, purchase and usage of agro chemicals in the farm level.

5. Recommendation

- Farmers and smallholders in the sales and purchase, uses and application of agrochemicals in the farm should be scrutinized by appointed qualified agronomist station in government agriculture department.
- All imports of agrochemicals should be registered and recorded at the national, state and district level.
- Agrochemical Importers, Agrochemicals wholesalers and Retailers need to follow stringent criteria to apply for the license to operate their premises with at least a degree in agriculture or agriculture economic from the local universities.
- Setting of government task forced to supervise the outlets of agrochemicals.
- Government setting up a licensing board to register all seller and user of agrochemical.
- Supervision on the storage of agrochemicals in premises
- Implementation of stringent law and regulation on the supply and usage of agrochemicals.

Acknowledgement

This is a conceptual paper, further wide scope study in empirical nature is needed to compare the legal perspectives of sales and purchase, uses and misuses of agrochemical among developing countries in the South East Asian region such as Indonesia, Thailand, Myanmar, Laos, Vietnam and other developing countries in the southern hemisphere.

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